



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/828,946	04/20/2004	Yee-Chung Fu	ANS-P107	7143
32566	7590	12/07/2005		
PATENT LAW GROUP LLP 2635 NORTH FIRST STREET SUITE 223 SAN JOSE, CA 95134			EXAMINER TAMAI, KARL I	
			ART UNIT 2834	PAPER NUMBER

DATE MAILED: 12/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/828,946	Applicant(s) FU, YEE-CHUNG	
	Examiner Tamai I.E. Karl	Art Unit 2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 7/5/2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 8-18, 20-26, 29-36 and 38-43 is/are rejected.
- 7) ☒ Claim(s) 6, 7, 19, 27, 28 and 37 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Specification

1. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 8, 11, 12, 20, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Olav et al. (Olav)(US 2003/0073261) and Conant et al. (Conant)(US 2003/0019832). Olav teaches a DC scanning micromirror 27 supported by beams with rotational combs and springs 26 connected to bonding pads. Olav teaches the stator having two upper (in plane) and two lower (out of plane) stationary electrodes connected to bonding pads. Olav does not teach the length of the mirror being greater than 4000 and less than 5500 microns, having a thickness greater than 240 microns or width of 1000-1200 microns. Conant teaches the mirror having a length of less than 10 millimeters and a thickness between 10 and 500 microns. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the mirror of Olav with the mirror having a length of the mirror being greater than 4000 and less than 5500 microns and having a thickness greater than 240 microns and having a width of 1000-1200, because Conant suggests that the dimensions for electrostatic actuator,

and because it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (see *In re Aller*, 105 USPQ 233).

4. Claims 2-4, 9, 10, 13-15, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Olav et al. (Olav)(US 2003/0073261) and Conant et al. (Conant)(US 2003/0019832), in further view of Abu-Ageel (US 6757092). Olav and Conant teach every aspect of the invention except the dimensions of the beam, springs, teeth and the pitch of the comb teeth, mirror gap, pad thickness, and electrode spacing from the axis of rotation. Abu-Ageel teaches the dimension in an electrostatic mirror actuator are result effective. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the mirror of Olav with the mirror dimensions set forth in claims 2-4, 13-15, 17, and 18 to optimize performance of the actuator and because it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (see *In re Aller*, 105 USPQ 233).

5. Claims 5, 21, 22, 33, 39, 40, 41, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Olav et al. (Olav)(US 2003/0073261) and Conant et al. (Conant)(US 2003/0019832), in further view of Dewa (US 6704132). Olav and Conant teach every aspect of the invention except rib beneath the mirror. Dewa teaches a central rib and beams on the back side of the mirror. Dewa does not teach the

thickness of the rib or crossbeams being 450-550 microns. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the mirror of Olav and Conant with the rib and truss framework of Dewa to allow the mirror to be rotated at high frequencies, and with the with the rib thickness being 450 - 550 microns to optimize performance of the actuator and because it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (see *In re Aller*, 105 USPQ 233).

6. Claim 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Olav et al. (Olav)(US 2003/0073261) and Conant et al. (Conant)(US 2003/0019832), in further view of Behin et al. (Behin)(US 2001/0050801). Olav and Conant teach every aspect of the invention the second and third stationary electrodes being used as capacitive sensors. Behin teaches the opposing stationary comb electrodes being used for capacitance sensing and feedback control (paragraph 0062). It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the mirror of Olav and Conant with the second and third stationary actuators being used for capacitance sensing and driving the mirror to provide feedback control, as taught by Behin.

7. Claims 23-26, 29-32, 35, 36, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Olav et al. (Olav)(US 2003/0073261), Conant et al. (Conant)(US 2003/0019832), and Dewa (US 6704132), in further view of Abu-Ageel

Art Unit: 2834

(US 6757092). Olav, Conant, and Dewa teach every aspect of the invention except the dimensions of the beam, springs, teeth and the pitch of the comb teeth, mirror gap, pad thickness, and electrode spacing from the axis of rotation. Abu-Ageel teaches the dimension in an electrostatic mirror actuator are result effective. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the mirror of Olav, Conant, and Dewa with the mirror dimensions set forth in claims 23-26, 29-32, 35, 36, and 38 to optimize performance of the actuator and because it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (see *In re Aller*, 105 USPQ 233).

8. Claim 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Olav, Conant, Dewa, and Abu-Ageel, in further view of Behin et al. (Behin)(US 2001/0050801). Olav, Conant, Dewa, and Abu-Ageel teach every aspect of the invention the second and third stationary electrodes being used as capacitive sensors. Behin teaches the opposing stationary comb electrodes being used for capacitance sensing and feedback control (paragraph 0062). It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the mirror of Olav, Conant, Dewa, and Abu-Ageel with the second and third stationary actuators being used for capacitance sensing and driving the mirror to provide feedback control, as taught by Behin.

Allowable Subject Matter

9. Claims 6, 7, 19, 27, 28, and 37 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karl I.E. Tamai whose telephone number is (571) 272 - 2036.

The examiner can be normally contacted on Monday through Friday from 8:00 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Darren Schuberg, can be reached at (571) 272 - 2044. The facsimile number for the Group is (571) 273 - 8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


KARL TAMAI
PRIMARY EXAMINER

Karl I Tamai
PRIMARY PATENT EXAMINER
December 6, 2005